

RESPONSE TO COMMENTS REGARDING THE UNDERGROUND INJECTION CONTROL (UIC) PERMIT # MI-075-2D-0009 ISSUED TO WEST BAY EXPLORATION COMPANY FOR THE WEST BAY #22 WELL IN JACKSON COUNTY, MICHIGAN FOR THE PURPOSE OF DISPOSAL OF OIL AND GAS RELATED BRINE.

Introduction

Date: 12/6/2012

This response is issued in accordance with Section 124.17(a), (b) and (c) of Title 40 of the Code of Federal Regulations, 40 CFR § 124.17(a), (b) and (c), which requires that at the time any final United States Environmental Protection Agency (EPA) permit decision is issued, the EPA shall: (1) describe and respond to all significant comments raised during the public comment period; (2) specify which provisions, if any, of the draft decision have been changed and the reasons for the change; (3) include in the administrative record any documents cited in the response to comments; and (4) make the response to comments available to the public.

Background

The first public comment period for this permitting decision began on January 20, 2012 and ended on February 20, a total 30 of days. Under 40 CFR § 124.10(b), EPA shall allow at least 30 days for public comment. During the first comment period, several commenters requested a public hearing. The public comment period was re-opened with the second public notice on April 17, 2012 and extended to June 1, 2012, a total of 45 days, for a combined total of 74 days. Public notices were published on January 20, and April 17, 2012, in a local newspaper, the Jackson Citizen Patriot, and mailed to (1) interested parties who had contacted EPA to be placed on the mailing list and (2) people who had made comments during the first public comment period. The public hearing was held on May 23, 2012, at Columbia Central High School in Brooklyn, Michigan. About 70 members of the public attended. Upon closure of the public comment period on June 1, 2012, EPA reviewed the issues raised by the public, gathered information to clarify those issues, and developed this response to comments document.

Final Determination

EPA has determined that the public comments submitted did not raise significant issues which would alter EPA's basis for determining that it is appropriate to issue West Bay Exploration Company a permit to construct and operate the proposed injection well. Therefore, EPA has issued the final permit to West Bay Exploration Company on the date shown at the top of this document.

Comment 1: Many commenters were concerned about the potential for the well to contaminate their future and present sources of drinking water. Commenters asked specifically how the aquifer will be protected.

Response 1: The purpose of the UIC program is to protect Underground Sources of Drinking Water (USDWs) from endangerment by underground injection practices. The UIC regulations are designed to protect USDWs from contamination. The permit application and the conditions in the permit are consistent with those regulations. The UIC program regulations protect USDWs

by (1) identifying drinking water sources for protection, (2) making sure the geological siting is suitable for injection, and (3) applying standards for well construction, operation, and reporting.

Identifying a USDW: The UIC program protects current and future sources of drinking water by defining a USDW broadly. USDWs by definition include fresh water aquifers in current use as well as those that meet certain criteria indicating they could be used as drinking water, even if they aren't currently used. Regulations define a USDW based on quantity, current usage, and the concentration of dissolved solids in the aquifer. The concentration of dissolved solids is an indicator as to whether an aquifer has the potential to be potable, even if it not currently used for drinking water. Specifically, UIC regulations (40 C.F.R. §§ 144.3 and 146.3) define a USDW as any aquifer which is currently being used as a drinking water source or which is of sufficient volume and adequate quality to be a source for a public water system. An aquifer or portion of an aquifer which contains less than 10,000 milligrams per liter (mg/L) of total dissolved solids is considered a potential drinking water source and is therefore protected even if it is not in use. (Potable water generally contains less than 500 mg/L of total dissolved solids.) By protecting water supplies that have more dissolved solids than normal drinking water, the UIC program also protects USDWs that could be used in the future. In the vicinity of the injection well, the lowermost USDW is identified as the Marshall Sandstone. The base of the Marshall Sandstone is located about 226 feet below ground surface.

Geologic Siting: Injection will occur in the Niagara Group interval between 2662 and 3032 feet below ground surface. The top of the injection zone is separated from the bottom of the USDW by approximately 2436 feet of rock formations layers. The Niagara Group is a vast limestone and dolomite formation structure underlying Michigan and parts of Illinois, Indiana, Ohio and New York. The injection zone is topped by the Salina A-2 Evaporite, an approximately 28-foot thick layer of anhydrite which will act as a confining layer to prevent flow out of the injection zone. Furthermore, many of the rock layers between the confining zone and the base of the USDW are impermeable shales and evaporites which will prevent injection fluid from moving upward to enter the USDW.

Construction, Operation Standards, Reporting: In addition to being sited in an area in which the geological formations are appropriate for injection, injection wells must be constructed and operated to prevent the injection fluid from contaminating a USDW. The well will be drilled to 2950 feet. The well will be constructed with three casing strings (steel pipe), set to 300, 900, and 2680 feet respectively. All steel casing strings will be cemented over their length to preclude the movement of fluids into and between USDWs due to injection operations. Injection will take place through tubing which is set within the long-string casing. A packer set at the bottom of the tubing will seal off the space between the casing and tubing. This space, called the annulus, will be filled with a liquid mixture containing a corrosion inhibitor. The pressure of the annulus liquid will be monitored to detect changes in pressure which indicate a leak. The pressure in the space between the tubing and casing (annulus) will be tested initially after the completion of the well to ensure that the well has mechanical integrity and monitored weekly thereafter to ensure that the well maintains mechanical integrity. Any loss of annulus fluid is monitored at least quarterly. If monitoring indicates a leak or if the well should fail a mechanical integrity demonstration, then the well will be shut down until corrective actions have been taken and the well has been brought back into compliance. Any work performed on the well that requires the

moving and/or removal of the tubing or packer must be followed by a mechanical integrity test before authorization to resume injection will be given. Under permit conditions, the injection pressure will be limited to ensure the safe operation of the well and monthly reports of pressure and flow rates must be submitted to our office for review.

Following review of the permit application, EPA has determined that there should be no impact to the drinking water supplies as a result of injection into this well because of the geology of the area and the engineering, operating and monitoring standards applied to the well.

Comment 2: Commenters questioned whether injection is the best technology available for brine disposal and were concerned about its safety.

Response 2: Before EPA regulated underground injection wells there were several incidents where injection wells leaked. Since EPA began regulating them, there has not been a documented case of an injection well contaminating an underground source of drinking water. Returning the brine to a confined formation below the lowermost underground source of drinking water through a properly constructed and operated injection well is an environmentally sound procedure. Several decades of experience regulating similar wells have shown that injection, under the proper conditions, can be safe and protective of fresh ground water supplies. We believe that the injected brine will remain isolated from drinking water.

The permit limits injection pressure to prevent the injected fluid from causing fractures in the rock, which could become conduits for the injected fluid to leave the injection zone. In this case, the permit limits the surface injection to 682 pounds per square inch, which EPA calculated using site-specific but conservative figures for waste and rock characteristics. The depth at which injection occurs in this well, 2436 feet below the deepest source of drinking water in the area, provides another margin of safety as does the confining layer and other geologic layers of impermeable shales and other rock formations. EPA also reviewed the deep wells in the 1/4 – mile zone surrounding the West Bay #22 site and determined that these wells are properly constructed or properly plugged and abandoned and will not act as conduits for injection fluids under pressure to move into the USDW.

Comment 3: Alternative disposal methods should be evaluated and/or selected. For instance, the brine should be treated.

Response 3: While EPA encourages treatment of waste as an alternative to disposal, the regulations do not require the permit applicant to evaluate alternatives to injection or to require other alternatives to be used. Returning waste fluids to a confined formation below the lowermost underground source of drinking water (USDW) through a properly constructed and operated injection well is an environmentally sound procedure.

Comment 4: Will fluid escape the injection zone and migrate upward? Can you guarantee that fluid will not escape the injection zone? What would happen if injected fluid did leave the injection zone?

Response 4: At the West Bay #22 site, it is unlikely that injected fluid will leave the injection zone. The Niagara Group is capable of receiving the injected fluid and is used as an injection zone elsewhere. The confining zone of massive anhydrite will act as a barrier to fluid migrating out of the injection zone.

No one can guarantee that injected fluid will not leave the injection zone. The purpose of the UIC program is to protect USDWs from being contaminated by underground injection practices. The construction, operation, and geological siting criteria, which prevent USDW contamination, do so in part by requiring the fluid to be injected into zones that will accept and retain the fluid and be underneath formations that will prevent the fluid from moving into USDWs.

If injected fluid were to exit the confining zone, it would migrate up into the next rock unit capable of accepting fluid. At the West Bay #22 site, the injection zone is separated from the lowest USDW by 2436 feet of geologic strata. Aside from the confining zone, many of the formations between the injection zone and the USDW are layered with impermeable shale and other rock types which will prevent movement of the injected fluid into the USDW.

Comment 5: The well will affect our current source of drinking water and our private water supply wells or private water supply wells will act as a conduit for injected brine to get into drinking water. Commenters also asked about the depths of area water supply wells.

Response 5: The purpose of the UIC program is to protect USDWs from being contaminated by underground injection practices. The Final UIC Permit will require the proposed injection well to be constructed and operated in such a manner so as to prevent the migration of any fluids into a USDW. As a result, there should be no connection between the operations of this injection well and the nearby drinking water wells. EPA reviewed the geology of the area and determined that the base of the lowermost USDW is separated from the injection zone by approximately 2436 feet of rock layers that include low permeability shales and a confining zone of massive anhydrite, which will prevent the injected brine from reaching the USDW.

Private water supply wells tap into ground water that is shallower than the base of the lowest USDW. EPA has reviewed drilling records for private wells in the area of review. These private water supply wells are 215 feet deep or shallower. They are not deep enough to encounter injected fluids, which will be injected more than 2600 feet deep. Most water wells are completed in aquifers with waters of 500 mg/l of Total Dissolved Solids (TDS) or less. The UIC program protects USDW of up to 10,000 mg/l TDS, which is too saline for human consumption without treatment.

Comment 6: Injected waste will affect surface waters, including area lakes, ponds, wetlands, and rivers, in particular the River Raisin. The injected fluid could impact the entire watershed and travel underground to the Great Lakes, and other States and the Canadian government may be concerned and should be contacted.

Response 6: The purpose of the UIC program is to protect USDWs from being contaminated by underground injection practices. The Final UIC Permit requires geologic siting of the proposed well and its proposed construction and operation that are sufficient to prevent upward

movement of the injected fluid into USDWs. As a result, operations of this injection well or injected waste should not affect surface water, whether in the county, in bordering counties and States, or in the Great Lakes. Although the UIC program is not designed to directly protect surface water, the UIC permit will protect surface water indirectly through protecting the groundwater aquifers to which they are connected. A watershed's connection with aquifers is limited to the aquifers that have connections with surface bodies of water like rivers. While area lakes and streams, including the River Raisin, may be in hydraulic communication with ground water or depend on ground water for flow, they are not deeper than the base of the lowermost USDW. For example, the maximum depth of Wamplers Lake is approximately 40 feet. Similarly, wetlands (which would include the unidentified fen mentioned by one commenter) are also shallower than the lowermost USDW. Lake Erie has a maximum depth of 210 feet, Lake Huron is 195 feet deep, and Lake Michigan is 279 feet deep.

Because the intended injection zone of the proposed injection well will be approximately 2,662 feet below ground surface, there is little likelihood of injected waste posing an environmental threat to surface waters, wetlands, or the Great Lakes. The base of the lowermost USDW is 226 feet below ground surface and separated from the injection zone by approximately 2436 feet of rock layers that include low permeability shales and a confining zone of massive anhydrite. These surface waters are not in communication with the injection zone, and there is no established causal link between underground injection of waste and contamination of Great Lakes water.

Comment 7: The proposed West Bay #22 and injected fluid will affect vegetation and soil in the area.

Response 7: The purpose of the UIC program is to protect USDWs from being contaminated by underground injection practices. The geologic siting of the proposed well and its proposed construction and operation are sufficient to prevent upward movement of the injected fluid into USDWs. As a result, there should be no connection between the operations of this injection well or injected waste and effects to vegetation and soil.

Vegetation and soils may be affected by surface activities and handling of wastes at the surface prior to injection, however. The UIC program does not regulate surface activities such as the construction of roads, pads, tanks, pipelines, or other surface facilities. The UIC program does not regulate the operation of surface facilities. These activities are regulated by the Michigan Department of Environmental Quality (MDEQ). Questions about surface activities should be directed to:

Mitch Adelman, District Coordinator
Jackson District Office
301 E Louis Glick Hwy
Jackson, MI 49201-1556
phone: (517) 780-7690
fax: (517) 780-7855

Comment 8: The well or injected waste will affect wildlife. EPA should analyze the well's potential impacts on federally threatened and endangered species. The Indiana bat, the Blanding's turtle, the Spotted turtle and another unnamed turtle species are concerns.

Response 8: The purpose of the UIC program is to protect USDWs from being contaminated by underground injection practices. The geologic siting of the proposed well and its proposed construction and operation are sufficient to prevent upward movement of the injected fluid into USDWs. Because injection in West Bay #22 will not affect the USDW, injected fluid will not affect wildlife and threatened and endangered species.

As a federal agency, EPA must comply with the Endangered Species Act. EPA identified two federally-designated threatened or endangered species and two candidate species (which are species that are not yet listed, but are proposed to be listed) that may potentially be found in Jackson County. Those species are, respectively: the Indiana bat, Mitchell's satyr butterfly, the Eastern massasauga (a rattlesnake), and the Poweshiek skipperling (a butterfly).

EPA determined that the immediate well area does not provide the habitat for these species. Briefly, the Indiana bat uses river corridors, woodlands and caves or mines; the Mitchell's satyr butterfly resides in fens, which are wetlands with calcareous soils; the Eastern massasauga uses wet marshes and low areas near rivers and lakes, along with some upland adjacent to these areas; the Poweshiek skipperling uses wet prairies and fens. -The area around the well is farmland, which generally provides no habitat for these species.- Nearby water bodies and wetlands in the surrounding farmland and in the county will not be affected by the well. Therefore, the well will not have an adverse effect on threatened and endangered species.

The U.S. Fish and Wildlife Service does not list any threatened or endangered turtle species for Jackson County. The Spotted turtle (*Clemmys guttata*) is a State-endangered species in Michigan, but is not federally protected. MDEQ, not EPA, is responsible for protecting state endangered species. The Spotted turtle inhabits wet bogs, streams, and marshes – none of which are present in the immediate area of the well. The Blanding's turtle is neither a federally listed or candidate threatened or endangered species, nor a State-listed species.

Surface activities at the well site may affect wildlife and general wildlife habitat, however. MDEQ regulates surface activities, such as pad construction, waste storage, and waste transportation, and surface runoff. Truck traffic and roads may be regulated by MDEQ and the Michigan Department of Transportation. Concerns about these activities should be directed to MDEQ (see contact information in Response 7).

Comment 9: EPA should require baseline analyses for water quality, drinking water analysis, aquatic habitat, and air baseline analysis.

Response 9: EPA regulations at 40 C.F.R. Parts 144 and 146 include standards that a permit applicant must meet to have a UIC permit application approved. These regulations deal primarily with the geologic siting, well engineering, operating, and monitoring standards for deep injection wells. Currently, the Federal UIC regulations for Class II wells do not require EPA to request that the owner/operator performs any baseline analyses of ground water or other resources.

Comment 10: EPA should prepare an Environmental Impact Statement.

Response 10: Federal Environmental Impact Statements, or EIS documents, are described under the National Environmental Policy Act (NEPA), which is the federal law that compels all federal agencies to consider environmental impacts in their decision-making process. Courts have recognized consistently that EPA's procedures and environmental reviews under enabling legislation are functionally equivalent to the NEPA process. This means that EPA is not required to prepare environmental analysis documentation for permits (except for certain surface water discharge permits), but may voluntarily do additional analyses if EPA believes a project has significant environmental impacts. EPA's experience to date, nationally as well as in Michigan, has been that Class II well injection does not have significant environmental impacts. Therefore, an EIS is not necessary for this permit action.

Michigan has a State environmental review law that is similar to NEPA, and requests regarding its requirements should be directed to MDEQ. EPA does not have a role in the Michigan program. Questions about the Michigan environmental review requirements should be directed to MDEQ (see contact information in Response 7).

Comment 11: The company already did an environmental assessment, and they or the State should make it public.

Response 11: EPA is not aware of an environmental assessment document prepared by the company. Further information may be available from MDEQ (see Response 7).

Comment 12: EPA should do a vulnerability assessment using well density and aquatic resources as measurements.

Response 12: It is not clear what analysis the comment requests. The commenter may be referring to a risk assessment, which is a decision-making tool to characterize the nature and magnitude of health risks to humans and ecological receptors from chemical contaminants and other stressors that may be present in the environment. For UIC permits, risk assessments are not done on a site specific basis, and the Federal UIC regulations for Class II wells do not require a permit applicant or owner/operator to perform a risk assessment. Risk assessments have been done on underground injection practices in general, though, and each permit application is reviewed to determine if additional information is needed. The UIC regulations mandate that the permit applicant must conduct a search for any other potential hydraulic conduits located within the area of review and submit data which describes the geologic units involved in the injection well operations, characteristics of the injected waste, and operation of the injection well. The submitted information allows the EPA to make an informed decision about the adequacy of the siting, construction and operation of the injection well. In this case, the applicant satisfied all requirements that ensure that no significant environmental impact will result from the proposed operation of this well.

Comment 13: EPA or the company should use another location because the proposed location has unsuitable aquatic characteristics, sensitivity, valuable water resources, and high subsurface radon levels. EPA should use its authority to make the company choose another location.

Response 13: EPA does not determine and has no control or authority over -the surface location of a well. The UIC program may consider only geologic siting (below the surface), construction and operation in making its permit decision. EPA must comply also with the federal Wild and Scenic Rivers Act, but has determined that no federally-designated Wild or Scenic Rivers are within the immediate area of the proposed well site. The injection well surface facility, including well location, is under the authority of MDEQ. Concerns about well location should be directed to MDEQ (see contact information in Response 7).

Comment 14: How many Class II injection wells are in Michigan, and how many will be permitted in the Jackson County area?

Response 14: Michigan has about 1,460 Class II wells, about 1,300 of which are disposal wells. There is one EPA-permitted Class II disposal well operating in Jackson County currently. EPA has received one other Class II disposal well application for Jackson County, also from West Bay Exploration Company.

Comment 15: The number of Class II injection wells should be limited in the area of Jackson County.

Response 15: EPA has no control or authority over the site location and cannot limit the number of Class II wells in any area. The injection well surface facility, including well location, is under the authority of the MDEQ. Concerns about well location should be should be directed to MDEQ (see contact information in Response 7).

Comment 16: There should be monitoring of nearby watersheds, ground water and drinking water. Will there be ground water monitoring wells? Will someone monitor surface water quality or ground water quality? If so, how often will ground water be monitored, by whom, who will pay for it, and will results be available to the public?

Response 16: UIC program authority extends to protection of USDWs. EPA regulations at 40 C.F.R. Parts 144 and 146 state the requirements and standards that a permit applicant must meet to have a UIC permit application approved. These regulations deal primarily with the geologic siting, well engineering, operating, and monitoring standards for deep injection wells. Federal UIC regulations for Class II wells do not require ground water monitoring wells, nor do they require the owner/operator to monitor ground water or surface water quality. Therefore, an EPA permit for this well will not require ground water monitoring wells or surface or ground water monitoring. The State may require ground water or surface water monitoring in certain circumstances. The UIC Branch does not have any influence over state requirements or the availability of those reports. Questions or concerns about monitoring should be directed to MDEQ (see contact information in Response 7) or the local health department.

Comment 17: Tracers should be added to the injected fluid to track if it moves into surface water, ground water, or drinking water.

Response 17: UIC program authority extends to protection of USDWs. EPA regulations at 40 C.F.R. Parts 144 and 146 state the requirements and standards that a permit applicant must meet

to have a UIC permit application approved. These regulations deal primarily with the geologic siting, well engineering, operating, and monitoring standards for deep injection wells. Federal UIC regulations for Class II wells do not require an owner/operator to add tracers into its injected fluid.

Comment 18: Where is the waste coming from?

Response 18: The permit allows the company to inject brine related to oil production generated by their own production wells only. The UIC regulations do not require an applicant or an owner/operator to provide the locations of its oil and gas production wells.

Comment 19: The term “brine” is misleading, and makes the injected fluid sound like table salt (sodium chloride) and water only. The company or EPA is attempting to intentionally mislead regulators and the public by calling the injected fluids brine.

Response 19: “Brine” is a commonly used term in industry and environmental regulation to describe fluids brought to the surface during the production of oil and gas. When used in context with a Class II permit, the term indicates the source of the fluid – an oil or gas production well – and a generalized chemical identity: water, dissolved constituents such as sodium, magnesium, and chlorides, and a usually small concentration of metals and hydrocarbons. It does not imply specific chemical contents or concentrations, however.

EPA has used several terms in its Class II well materials over time; brine, oil-production related fluids, and salt water are some of the terms used in EPA documents. Regardless of the terms used, the regulations and UIC permits pertain to oil and gas production-related fluids that come from production wells, whatever the specific composition.

Comment 20: What is the chemical composition of brine? What chemical analysis did West Bay Exploration Company send to EPA with its application?

Response 20: Constituents found commonly in brines are sodium, calcium, magnesium, barium, total iron, chloride, sulfate, carbonate, bicarbonate, sulfide and total dissolved solids. Oilfield brines may contain various amounts of hydrocarbons, such as benzene, ethylbenzene, toluene, xylene, naphthalene and polycyclic aromatic hydrocarbons. These compounds occur naturally in fluids that are separated from the oil and/or gas.

EPA has determined that the applicant has provided sufficient information, including a representative brine analysis, to allow EPA to make a permitting decision. The chemical analysis of a representative brine sample submitted by West Bay Exploration Company with the application is attached (Attachment 1).

Comment 21: What does EPA require from companies for testing the waste stream for this permit?

Response 21: EPA regulations at 40 CFR 146.24 (a)(4)(iii) state that applicants will submit “... an analysis of the physical and chemical characteristics of the injection fluid.” The

regulation does not include a list of chemicals to be analyzed for Class II wells. EPA Region 5's permitting tool entitled Example: Underground Injection Control Class II Permit Application instructs applicants to provide a fluid analysis that includes, but is not limited to the following: Sodium, Calcium, Magnesium, Barium, Total Iron, Chloride, Sulfate, Carbonate, Bicarbonate, Sulfide, Total Dissolved Solids, pH, Resistivity (ohm-meters), and Specific Gravity." EPA has determined that the applicant has provided sufficient information about the injection fluid.

Comment 22: Fracking fluid will be disposed of in this well.

Response 22: The permit allows the owner/operator to dispose of any fluid produced from oil and gas production wells, including hydraulic fracturing-related fluids. The company has stated that they are not fracturing their oil production wells.

Comment 23: Other materials besides brine will be injected and should be accounted for in the permit.

Response 23: The permit will not allow the company to add waste that is not produced from its own oil or gas production wells. The injected fluid may also potentially contain small amounts of other material coming from oil production wells, such as drilling fluids or acid used to clean or complete production wells. These materials are part of the allowable waste fluid, as long as they are produced from the company's oil or gas production wells.

Comment 24: The chemical constituents of oil field brine are hazardous and toxic and should not be injected in a Class II injection well without further study. This well should be reclassified as Class I hazardous waste well because the constituents are hazardous and toxic.

Response 24: The West Bay #22 well is proposed and permitted as a Class II well because it will be used to dispose fluids brought to the surface in connection with conventional oil and natural gas production. Class II disposal injection wells are defined by regulation in 40 CFR 146.5(b)(1) as "wells which inject fluids which are brought to the surface in connection with conventional oil or natural gas production and may be commingled with waste waters from gas plants which are an integral part of production operations, unless those waters are classified as a hazardous waste at the time of injection." Brine has been exempted from the definition of hazardous waste under the Resource Conservation and Recovery Act under 40 C.F.R. 261.4(b)(5), which specifically exempts "drilling fluids, produced waters, and other wastes associated with the exploration, development, or production of crude oil, natural gas or geothermal energy." This means that the fluid coming out of the production well, which is called brine but may also include drilling fluids among other things, can be injected into a Class II well, regardless of its constituents.

Comment 25: There are health effects from chemicals in the injected brine and more studies should be done about health and environmental effects of chemicals in brine.

Response 25: Numerous studies already detail the health effects from these compounds in various settings and at various concentrations. The geologic siting of the well and the well construction and operation are sufficient to prevent upward movement of the injected fluid into

USDWs. EPA therefore anticipates that injection at this site will not affect human health or the environment. Several decades of experience regulating similar wells have shown that injection, under the proper conditions, can be safe and protective of fresh ground water supplies.

Comment 26: Naturally-occurring radioactive materials (NORM) and technically enhanced naturally-occurring radioactive materials (TENORM) in oil and gas production wastes are a serious concern according to EPA's own website. Injection should not be allowed, or monitoring and reporting requirements should include regular sampling for it in the injected fluids, on equipment and on the surface area of the site.

Response 26: The commenter is correct in pointing out that EPA's website on NORM and TENORM describes concerns about radionuclides in oil and gas production wastes. With regard to produced fluids, EPA's website also confirms that EPA considers Class II injection wells a safe method for brine disposal. No added radiological risks have been associated with this disposal method, so long as the injected fluid does not migrate to a USDW. The geologic siting of the well and the well construction and operation are sufficient to prevent upward movement of the injected fluid into USDWs. EPA therefore anticipates that injection at this site will not affect human health or the environment.

The UIC permit is concerned with injection only. Concerns about NORM and TENORM on surface equipment and in other wastes should be directed to MDEQ (see contact information in Response 7).

Comment 27: Brine composition and chemical additives to the injected fluid are being concealed from the public and EPA, or being concealed by EPA.

Response 27: EPA is not concealing information from the public about brine constituents at this well. The chemical analysis of a representative brine sample submitted by West Bay Exploration Company with the application is attached as requested by commenters (Attachment 1). EPA regulations at 40 CFR 146.24 (a)(4)(iii), while requiring a fluid analysis, do not include a list chemicals to be analyzed for Class II wells. EPA Region 5 guidance includes a list of chemicals that applicants must report for Class II well fluids (see Response 21); the Region 5 guidance list contains analytes that help verify that the fluid is oil or gas-production related brine. EPA has determined that the applicant has provided sufficient information, including a representative brine analysis, to allow EPA to make a permitting decision.

Comment 28: The waste stream will be changed without notice.

Response 28: The permittee is not allowed to change the waste stream without permission from EPA. In this case, a change to the waste stream would require a new permit.

Comment 29: The brine will corrode the steel well casing and/or surface pipes.

Response 29: The well is designed so that the brine will not contact the steel well casing. Injection will take place through tubing set within the casing. A packer set at the bottom of the tubing will seal off the space between the casing and the tubing. This sealed-off space between

the casing and tubing, called the annulus, will be filled with a liquid mixture containing a corrosion inhibitor. If a leak occurs in the tubing, monitoring equipment will detect a change in the pressure. The well must be immediately shut in until the leak is repaired and the well passes an annulus pressure test. This system prevents brine from coming into contact with the well casing. EPA has authority over the injection activity only and does not regulate surface facilities. Concerns about surface facilities, including pipelines should be directed to MDEQ (see contact information in Response 7).

Comment 30: Can or will this well be used for enhancing oil production as well as brine disposal?

Response 30: The permit is for a Class II noncommercial brine disposal well. The well could not be used for enhanced oil recovery unless the owner/operator applied for a modification to the permit.

Comment 31: The site geology is not well known enough to permit injection. EPA needs to do more studies on the geology of the area beneath the well.

Response 31: Michigan geology is well-documented and existing information is sufficient to make a permitting decision for this well. EPA uses technical studies of the geology of Michigan (such as The Hydrogeologic Atlas of Michigan). Michigan geology is relatively consistent across the state, and we have data from hundreds of Michigan wells that have been permitted by our office, as well. In addition, we reviewed geologic data in driller's logs or formation records from nearby wells. All the information we have indicates the injection zone is capable of receiving injected brine and that the confining zone and overlying strata will effectively prevent injected fluid from contaminating USDWs.

Comment 32: The permit does not mention that the radon level of the area is "Zone 1." Wells should not be drilled into areas with "Zone 1" high potential for radon gas.

Response 32: This comment refers to EPA's Map of Radon Zones. This system is for the identification of areas with potential for indoor radon. The Map was developed using five factors to determine radon potential: 1) indoor radon measurements; 2) geology; 3) aerial radioactivity; 4) soil permeability; and 5) housing foundation type. "Zone 1" indicates counties that have a predicted average indoor radon screening level greater than 4 pCi/L (picocuries per liter), or the highest indoor radon potential.

The radon zone is not mentioned in the permit because it is not part of the UIC program's regulatory criteria or standards. EPA regulations at 40 C.F.R. Parts 144 and 146 state the requirements and standards that a permit applicant must meet to have a UIC permit application approved. The UIC regulations deal primarily with the geologic suitability, well engineering, operating and monitoring standards for deep injection wells. Regarding geology, the UIC program must consider the area geology's suitability to prevent movement of fluid into a USDW, not its potential radon content. In this case, the geologic siting of the well and the well construction and operation are sufficient to prevent upward movement of the injected fluid into

USDWs. Concerns about well location are outside the scope of EPA's consideration and should be directed to MDEQ (see contact information in Response 7).

Comment 33: Drilling the well will release underground toxins and gases into the atmosphere or will -cause harmful chemicals to move between underground rock layers.

Response 33: The purpose of the UIC program is to protect USDWs from being contaminated by underground injection practices. There are several safeguards established to prevent the well from contaminating an underground source of drinking water. Some of these features would also help -to prevent the well from becoming a conduit for fluid to move between layers of underground rock. For example, as explained in Response 1, EPA requires well casings to be cemented to the surface. In addition, the well will be open at the bottom to only the injection zone. This zone is not known to have quantities of natural gas or hazardous chemicals that vent to the surface.

Comment 34: The anhydrite confining layer is not an adequate confining layer. Scientific research proves anhydrite is soft and that, when in contact with the injected fluid, anhydrite will leak, dissolve, or transform into less competent minerals, and otherwise let injected fluid out of the injection zone and into contact with ground and possibly surface water.

Response 34: In general, massive anhydrite, like the Salina A-2 Evaporite, is impermeable (in geology, the term *massive* means crystalline and homogeneous). The Salina A-2 Evaporite is a well-documented geologic barrier to flow and is often found as a cap rock or salt dome, trapping oil or natural gas in subsurface reservoirs. EPA Region 5 has permitted many wells across Michigan with the same injection and confining zone as the proposed West Bay #22 well.

The hardness of anhydrite, at 3.5 out of 10 on the Mohs scale of relative hardness, was mentioned as a concern. The Mohs scale of relative hardness measures relative mineral hardness only and does not predict the behavior of rock layers. The behavior of a rock layer depends on many factors, such as its thickness, flexibility, and chemical composition, and the pressure it is under. Mineral hardness, therefore, is not a sole determining factor of a rock layer's suitability as a confining zone and, in this case, does not affect EPA's acceptance of the Salina A-2 Evaporite layer as a suitable confining zone.

The commenter cited several sources for anhydrite information in the comment, but did not provide the cited materials. Several cited sources were located and the abstracts for others were found. A review of this information did not find evidence that the Salina A-2 Evaporite is a poor confining layer or that operation of the West Bay #22 well would dissolve the Salina A-2 Evaporite layer to create a pathway into the USDW. The papers cited by the commenter concern mineral reactions in situations that are not analogous or relevant to the Salina A-2 Evaporite below the well site. For example, several cited papers dealt with experiments that investigate chemical reactions at surface conditions or evaluate anhydrite as it is used in cement and concrete. Other papers are concerned with investigating the formational origin of evaporite minerals, not their behavior at depth with respect to fluids. Such work is not relevant to gauging the behavior of the Salina A-2 Evaporite layer at approximately 2630 feet below the surface, where the pressure and temperature regime is much different and influences mineral reactions

and rock behavior. Another cited paper describes anhydrite zone failure beneath a town in Germany. The paper attributes the 2007 event to the drilling of geothermal heat exchange boreholes into an anhydrite layer approximately 195 feet below the surface. The situation described in this paper is not relevant to the permit decision, because the geologic setting of the German town is very different from the geologic regime at the West Bay #22 site, and geothermal heat exchange technology is different than Class II injection well technology.

Finally, lithologic composition of the confining zone would not automatically disqualify the geologic siting of the West Bay #22 well. If brine fluid were to interact with the Salina A-2 Evaporite layer and somehow breach the confining zone, fluid would migrate up into the next rock unit that would accept fluid. The injection zone is separated from the lowest USDW by 2436 feet of geologic strata. Many of the formations between the injection zone and the USDW are layered with impermeable shale and other rock types which will also prevent movement of the injected fluid into the USDW. The geology at the well site is sufficient to prevent upward movement of the injected fluid into USDWs.

Comment 35: The injection zone will not have capacity to accept the injected fluid. How will EPA or the company respond if the injection zone does not have enough capacity or if it fills up?

Response 35: EPA believes that the proposed injection zone, the Niagara Dolomite, is capable of receiving large volumes of produced brine. Michigan geology is consistent over a large area, meaning the injection zone is vast. If, however, the injection zone's capacity were to decrease, that is, if it were unable to receive more fluid, the owner/operator would receive information via monitoring equipment that the zone is not accepting fluid at the permitted injection rate. The owner/operator may not inject at a higher pressure than permitted.

Comment 36: Does the permit limit volume of injectate on a daily basis or as a total amount related to injection zone capacity?

Response 36: The permit does not directly limit injection volume to a daily amount. Injection pressure acts as a limiting factor to daily volume. Because the owner/operator cannot inject at a higher pressure, injection is limited to the amount the injection zone can receive at the permitted maximum injection pressure. The maximum injection pressure is calculated using conservative figures for the physical properties of the injection zone and the injected fluid. Similarly, injection pressure also acts as an overall limiting factor for total volume, as described in Response 35.

Comment 37: The injection well will cause earthquakes, such as the instances of earthquakes in Ohio that the Ohio Department of Natural Resources and the United States Geological Survey have reported on.

Response 37: It is very unlikely that a seismic event would occur related to this disposal well. Several commenters pointed to reports on seismic events in Youngstown, Ohio. Such reports discuss conditions that could lead to seismicity, including existing faults and proximity of an injection well to such faults. These and other reports note that geologists believe it is very difficult for all conditions to be met to induce seismic events. The geologic setting of the West

Bay #22 well is different than those in Youngstown, Ohio, which were drilled into deeper, crystalline rock. Michigan geology has been well studied, and the injection zone is not known to have fractures or other faults.

Comment 38: Injection could cause subsurface settling from injection-related disturbance.

Response 38: Settling (sinking of the ground surface) due to injection at these depths is unlikely. Such settling, or subsidence, is more commonly a result of activities that withdraw materials from below the surface, like mining, rather than injection.

Comment 39: Injection could cause fractures in the confining zone or injection zone which would allow injected brine to escape. Even if injection would not cause fractures at the permitted pressure, the permitted pressure could be raised in the future, causing fractures in these zones.

Response 39: It is unlikely that injection will cause fractures in the injection or confining zones. EPA limits the maximum injection pressure for this well to a value less than the pressure needed to sustain fractures in the injection zone (called the fracture pressure). EPA calculated the maximum injection pressure using conservative figures for the physical properties of the injection zone rock and the injected fluid. EPA would modify the injection pressure only if it had new information about the injection fluid or injection zone formation. Even if the injection pressure were modified, it would be limited to a value less than the fracture pressure for the formation.

Comment 40: The company is going to hydraulically fracture this well or other wells.

Response 40: Regarding the West Bay #22 injection well, the application does not include hydraulic fracturing in the discussion of construction. The injection pressure in the permit is calculated to be below the fracture pressure of the injection zone, meaning that the injected fluid should not cause fractures in the Niagara Dolomite. Regarding other West Bay Corporation wells, EPA does not have authority over oil production wells and has authority over hydraulic fracturing practices only in cases when the hydraulic fracturing-related fluid contains diesel. EPA is not aware that such fluids would be used by the company and further notes that the company has stated that they are not fracturing this or any other well.

Comment 41: The quarter mile area-of-review is not large enough, and EPA should expand review area to include other deep wells and drinking water wells outside the 1/4-mile area of review.

Response 41: EPA is using a 1/4-mile area of review as proscribed by regulations under 40 CFR 147.1155 (a), which pertain to Michigan. “Notwithstanding the alternatives presented in §146.6 of this chapter, the area of review for Class II wells shall be a fixed radius as described in §146.6(b) of this chapter.” 40 CFR 146.6(b) describes a 1/4-mile area of review.

Comment 42: EPA should do more studies on where the waste will end up. In particular, EPA should model how far the injected fluid will spread and should make these results public. EPA should model how far injected fluid is likely to spread.

Response 42: During the May 23, 2012, information session that preceded the public hearing for the draft permit, participants asked EPA to calculate how far the injected fluid is likely to spread in the injection zone. EPA agreed to provide this information.

EPA uses the modified version of the Theis equation found in the UIC regulations at 40 CFR 146.6 to model the zone of influence. The Theis equation is a way to calculate fluid movement in a porous medium. We used conservative values for the injection zone's physical characteristics, with the intent of maximizing the result. The injection rate we used, 1200 barrels per day, is from the company's permit application. According to our calculations, injected fluid could travel a radius of 835 feet from the well in 20 years, if operated continuously at 1200 barrels per day. This is the largest radius yielded by our calculations. Lower radius values ranged between 68 and 205 feet. (The area of review for the well is ¼ mile radius, or 1,320 feet.)

Comment 43: EPA can't guarantee 100% that there will be no leaks. How would regulators know if there was a leak?

Response 43: No one can say with 100% assurance that the West Bay #22 well will not develop a leak. The risk of a leak from this well is very small, however, and the risk of contaminating an USDW is much smaller. This conclusion is based both on the protectiveness provided when the UIC requirements are applied to a particular well application, and the real-world information generated for many years from wells injecting brine. Beyond the data from the existing brine wells, the design, engineering, construction, operation and maintenance requirements provide a high level of confidence that a leak will not occur.

There are several safeguards established to prevent the well from contaminating an underground source of drinking water. EPA requires well casings to be cemented to the surface. Injection takes place through tubing set within the casing. In addition, the applicant is required to conduct and pass a Mechanical Integrity Test (MIT), in accordance with 40 CFR § 146.8, before authorization to inject is granted, and after the well is completed. The applicant is also required to repeat the MIT, at least once every five years thereafter. The UIC monitoring and testing requirements are designed to detect pressure changes between the tubing and annulus, thereby promptly detecting a leak. If a leak is detected, the UIC regulations require the operator to immediately cease operating the well until the leak is fixed and the repair is confirmed through testing.

Comment 44: Half of all well casings fail over time. How many leaks are found in casings as compared to injection tubing leaks? Are there any failures that happen apart from the casing?

Response 44: EPA is not aware of data that support the commenter's statement that half of all well casings fail over time. Before EPA regulated underground injection wells there were several incidents where injection wells leaked. A review of well failures that EPA conducted during development of the regulations showed that the federal UIC regulations, as are now in

force, would have prevented these failures. Since EPA began regulating them, there has not been a documented case of an injection well contaminating an underground source of drinking water.

EPA has imposed requirements on the permittee for testing the mechanical integrity of a well. Under the regulations “an injection well has mechanical integrity if: (1) there is no significant leak in the casing, tubing, or packer; and (2) there is no significant fluid movement into an USDW through vertical channels adjacent to the injection well bore” [40 C.F.R. Section 146.8(a)]. When a well loses mechanical integrity, it is usually because of an internal leak in the tubing or the packer. With this kind of leak, fluid could leak from the tubing but would still be within the well casing. In most incidences, the tubing and packer can be repaired or replaced. A review of Region 5 records indicates that instances where mechanical integrity was lost were the result of tubing or packer leaks. Region 5 has had no incidences where loss of mechanical integrity was traced to leaks in well casings or faulty cement surrounding the casing.

Comment 45: There will be no oversight of well closure or continued monitoring after the well is closed.

Response 45: EPA does not agree that there is no oversight of well closure. The West Bay #22 well permit includes a plugging and abandonment plan that meets UIC regulatory requirements. Before plugging and abandoning the well, the operator must notify EPA and submit a plugging and abandonment plan for approval. Following well closure, the operator must submit a cementing record for EPA review. Well closure does not relieve the owner/operator of any liability should an endangerment to the USDWs occur due to some defect in quantities, methods, or quality of materials used during plugging and abandonment. An owner/operator may still be held liable for such endangerment under provisions in the Safe Drinking Water Act. The UIC regulations do not give EPA authority to require post-closure monitoring for Class II injection wells. Questions or concerns about monitoring should be directed to MDEQ (see contact information in Response 7) or the local health department.

Comment 46: How often are monitoring reports sent to EPA, who does the monitoring, and how can the public access the information?

Response 46: In accordance with 40 CFR Sections 144.54 and 146.23, the applicant will be responsible for observing and recording injection pressure, flow rate, annulus pressure, and cumulative volume on a weekly basis and reporting this to the EPA on a monthly basis. The applicant will also be responsible for observing, recording and reporting annulus liquid loss on a quarterly basis. An analysis of the injected fluid must be submitted on an annual basis. The applicant is required to repeat a mechanical integrity test at least once every five (5) years. These documents must be certified by the operator.

Requests for paper copies of any documents that are public records should be made through the Freedom of Information Act (FOIA). There are four options as to how to make a request. The first option is by making a request on-line at <http://www.epa.gov/region5/answers/foia/efoia-form.htm>. The second option is by email at r5foia@epa.gov. The third option is to send a fax. The fax number is 312-886-1515. The last option is to mail the request. Send the request to:

Freedom of Information Officer

U.S. EPA Region 5 (MI-9J)
77 West Jackson Blvd.
Chicago, Illinois 60604-3590

Comment 47: The company should not be relied on to self-report.

Response 47: Self-monitoring and self-reporting are fundamental elements of the UIC permit program and other regulatory programs. Agency inspections and oversight verify the accuracy of the facility's self-monitoring and reporting, and the facility is subject to penalties and sanctions for failure to comply with its obligations. Self monitoring is consistent with the SDWA.

Comment 48: This company already caused contamination at well sites in northern Michigan in the 1980s. EPA should consider and provide information on the company's past actions.

Response 48: EPA regulations at 40 C.F.R. Parts 144 and 146 state the requirements and standards that a permit applicant must meet to have a UIC permit application approved. These regulations deal primarily with the geologic siting, well engineering, operating, and monitoring standards for deep injection wells. The owner's background and compliance history are not addressed by the UIC regulations. These issues do not impact any technical or operational requirements of the well being permitted here and so are outside the scope of the UIC permit process.

Comment 49: EPA gave Environmental Disposal Systems, Inc. (EDS) in Wayne County, Michigan an injection permit, and the well leaked and caused ground water contamination.

Response 49: Michigan inspectors shut down the EDS facility due to leaks observed in the above ground piping that is subject to State permits (the UIC program does not regulate the operation of surface facilities). The leaks did not occur in the injection wells, and regular mechanical integrity testing has been performed as required by the regulations and has demonstrated that the wells have not leaked. EPA initiated termination of EDS's UIC permits in 2007 citing administrative failures, such as poor recordkeeping, failure to perform emergency tests, and failure to tell regulators that ownership had been passed to another company. This Class I disposal facility is now operated by a different company under new permits. These issues do not impact any technical or operational requirements of the West Bay #22 well and so are outside the scope of this permit action.

Comment 50: The Gelman Sciences injection well in Ann Arbor leaked and contaminated ground water.

Response 50: At Gelman Sciences, waste was stored in unlined surface lagoons and spread on the ground for disposal. Ground water was contaminated by these surface activities, not by injection underground, though Gelman Sciences did operate a deep injection well in the early 1980s. The UIC program does not regulate the operation of surface facilities. These activities are regulated by the MDEQ. These issues do not impact any technical or operational requirements of the West Bay #22 well and so are outside the scope of this permit action.

Comment 51: Injection wells have caused aquifer and well contamination— in 2005 fluids from a Class II well in Texas came bubbling to the surface and other nearby water wells outside the quarter mile radius around the injection well. This incident shows that contamination could happen from the West Bay #22 well.

Response 51: There has not been a documented case of an injection well contaminating an underground source of drinking water since EPA began regulating them. While it is true that fluid came to the surface in the Chico, Texas area, there was no documented contamination of an underground source of drinking water by the injection fluid. To clarify, regulators in Texas determined that the Chico area injection wells were injecting into a small injection zone, which became over-pressurized, forcing fluid up other deep wells that were not properly constructed or plugged, or had not been identified during permit review. The injection wells were reworked to access a different injection zone with more capacity, and injection rates were restricted by State regulators.

The circumstances and geologic setting in Michigan and at the West Bay #22 well site are different than those in Texas which caused the fluid to rise through conduits. The geology of Michigan is relatively consistent across the state, meaning that rock strata are consistent over a large area. Driller's logs or formation records from nearby wells were used to review geologic data from the area. EPA has data gathered from the hundreds of wells that have been permitted by our office, together with technical studies of the geology of Michigan, such as The Hydrogeologic Atlas of Michigan. EPA has found this well site to be geologically suited for Class II disposal wells. EPA also determined that the wells within the area of review are properly constructed or plugged. Furthermore, as stated previously, the well will be constructed, maintained and operated to confine the injected fluids to the permitted interval and prevent the migration of any fluids into and between USDWs. As a result, there should be no effect on nearby drinking water wells from the operations of this injection well.

Comment 52: EPA should adopt injection well requirements such as Ohio's new requirements or such as those suggested by the International Energy Agency.

Response 52: EPA regulations at 40 C.F.R. Parts 144 and 146 state the requirements and standards that a permit applicant must meet to have a UIC permit application approved. These regulations deal primarily with the geologic siting, well engineering, operating, and monitoring standards for deep injection wells. These are the only things that the UIC program can take into consideration. EPA's Environmental Appeals Board has confirmed this view in other UIC permit cases. Two cases where the board addressed other factors in the decision making process are *In re Envotech*, L.P., 6 E.A.D. 260 (EAB 1996) and *In re Beckman Production Services*, 5 E.A.D. 10 (EAB 1994). The Environmental Appeals Board in *Envotech* stated: "...the Region has a narrow and clearly defined responsibility in this matter. It is charged with implementing the UIC regulations promulgated by EPA in accordance with the mandate of Congress in the Safe Drinking Water Act...." In *Beckman*, the Environmental Appeals Board stated: "EPA's inquiry in issuing a UIC permit is limited solely to whether the permit applicant has demonstrated that it has complied with the federal regulatory standards for issuance of the permit."

Comment 53: EPA does not have adequate resources to conduct oversight, enforce this permit, or inspect the well.

Response 53: This statement is not accurate. The facility's operation is tracked and monitored for compliance with permit conditions through the review of monthly, quarterly and annual reports submitted by the operators. EPA Region 5 UIC field staff or their representative will visit the facility to witness deep well tests required by the permits. The UIC program has an active field inspection program which employs a full-time field inspector in the State of Michigan, and EPA may inspect the facility at any time. If any non-compliance is noted from reviewing reports or during inspection, the UIC program takes appropriate action to ensure the well returns to compliance. In addition, the State of Michigan has an inspection program, and refers possible non-compliance to the EPA for appropriate enforcement action.

Comment 54: EPA is only looking at the wellhead and protecting groundwater and should be looking at other environmental concerns.

Response 54: The purpose of the UIC program is to protect USDWs from being contaminated by underground injection practices. The geologic siting of the proposed well and its proposed construction and operation are sufficient to prevent upward movement of the injected fluid into USDWs. EPA regulations at 40 C.F.R. Parts 144 and 146 state the requirements and standards that a permit applicant must meet to have a UIC permit application approved. These regulations deal primarily with the geologic siting, well engineering, operating, and monitoring standards for deep injection wells. To the extent this comment questions the nature of the UIC program and its regulations; any such challenge is beyond the scope of this UIC permitting action.

Comment 55: EPA has no experience with injection wells in Michigan.

Response 55: This statement is not accurate. EPA Region 5 has managed the Michigan Class II permit program since 1984 and has permitted at least 1,460 Class II wells in the State, about 1,300 of which are disposal wells. The UIC permit program evaluates the impacts of its permits using federal regulations and permitting guidance which are based on scientific information and on the agency's experience. Since the proposed West Bay #22 well will meet all federal UIC requirements for environmental protection, issuing a final permit for this well is justified.

Comment 56: A permit denial is in accordance with 40 CFR 146.9 (Criteria for establishing permitting priorities), which states that contamination and affected population should be taken into account.

Response 56: The regulations cited by the commenter are not criteria for approving or denying permits. The intent of this section was to assist regulators to set UIC program priorities for bringing existing wells into the federal UIC permit program when the regulations were promulgated. This section sets out factors that regulators should take into account when setting times for owners or operators to submit applications for authorization to inject.

Comment 57: Under 40 CFR 124.5, permits may be modified at the request of any interested person. The well location should be modified to another location.

Response 57: 40 CFR 124.5 allows the public or other parties to bring forward information that can help EPA to decide whether a permit needs to be modified. It describes part of the public input process by which EPA sought, received, considered, and is now responding to comments. As described elsewhere in this response document, EPA has no authority over well location. EPA regulations at 40 C.F.R. Parts 144 and 146 state the requirements and standards that a permit applicant must meet to have a UIC permit application approved. These regulations deal primarily with the geologic siting, well engineering, operating, and monitoring standards for deep injection wells.

Comment 58: There should be a public hearing.

Response 58: A public hearing for the West Bay #22 draft permit was held on May 23, 2012 at Columbia Central High School in Brooklyn, Michigan.

Comment 59: What is the process for public comments and decision-making and how can the public access the administrative record for the permit?

Response 59: The process for public notice and public comment is described in 40 CFR 124. If EPA decides to issue a permit, EPA will prepare a draft permit and publish notice of its decision with instructions on how to access the draft permit. EPA accepts comments on the draft permit for a 30-day period. If EPA decides not to issue a permit after reviewing an application, EPA will publish a notice and accept comments as well. EPA may also hold a public hearing at the outset or schedule a hearing in response to comments, as was the case for West Bay #22. The public comment period is automatically extended to the close of any public hearing or to a later date. During the public comment period, any interested person may submit written comments on the draft permit or request a hearing. At a public hearing, any person may submit oral or written statements and data concerning the draft permit. A tape recording or written transcript of the hearing shall be made available to the public. EPA will consider all comments received. At the time that any final permit decision is issued, EPA also issues a response to comments, in which EPA specifies which provisions, if any, of the draft permit have been changed in the final permit decision, and the reasons for the change. EPA's response to comments also describes and responds to all significant comments on the draft permit raised during the public comment period, or during any hearing.

Within 30 days after a final permit decision has been issued, any person who filed comments on that draft permit by mail, e-mail or at the public hearing (oral or written statements) may petition the Environmental Appeals Board to review any condition of the permit decision. The appeal process is described at the end of this document.

Requests for paper copies of any documents that are public records, including the administrative record for the permit, should be made through the Freedom of Information Act (FOIA). There are four options as to how to make a request. The first option is by making a request on-line at <http://www.epa.gov/region5/answers/foia/efoia-form.htm>. The second option is by email at

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r5foia@epa.gov. The third option is to send a fax. The fax number is 312-886-1515. The last option is to mail the request. Send the request to:

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U.S. EPA Region 5 (MI-9J)
77 West Jackson Blvd.
Chicago, Illinois 60604-3590

Comment 60: There was no meaningful notice or opportunity for public input. The public comment period was too short.

Response 60: EPA regulations allow a minimum 30-day public comment period. In this case, the public had several opportunities to voice their opinions on the West Bay #22 draft permit. The initial public notice, published January 20, 2012, began a 30-day public comment period, specified by UIC regulations. In this case, because EPA held a public hearing in response to initial comments, EPA published a second public notice extending the comment period to June 1, 2012. EPA held an information session followed by a public hearing to record comments on May 23, 2012. In addition to the comments from the public hearing, EPA received 82 written and emailed comments.

Comment 61: EPA should have placed the public notice of the permit and the meeting in a different local newspaper in Brooklyn, Michigan.

Response 61: EPA published both public notices in The Jackson Citizen Patriot, a newspaper serving Jackson County, Michigan to reach people who might have an interest in the draft permit. This publication was recommended by Norvell Township officials. The number of comments we received (82) and the attendance at the public hearing (approximately 70 people) indicate that the public notices reached a wide audience. The commenter did not mention a specific preferred newspaper.

Comment 62: All residents in the area, including people in neighboring counties, should have been notified individually.

Response 62: EPA mailed notification of the public comment period to parties within the ¼-mile area of review. As required by federal regulations in 40 CFR 124.10 (c)(2)(i), EPA must provide public notice of a draft permit and public comment period in a daily or weekly newspaper within the area affected by the facility or activity. EPA chose the Jackson Citizen Patriot as the local paper likely to reach people who might have an interest in the draft permit, and both public notices were published in this paper. This publication was recommended by Norvell Township officials. EPA determined in its evaluation of the application that neighboring counties are not within the area affected by the facility or activity. The number of comments we received (more than 80) and the attendance at the public hearing (approximately 70 people) indicate that the public notices reached a wide audience.

Comment 63: EPA did not attempt to inform or educate the public on injection wells in general and this draft permit.

Response 63: This statement is not accurate. EPA published both public notices in The Jackson Citizen Patriot, a newspaper serving Jackson County, Michigan to reach people who might have an interest in the draft permit. EPA mailed both public notices to residents within the ¼-mile area of review and to State and local officials. In addition, EPA added all commenters on the first public notice to the recipients list for the second public notice. All these materials contained website addresses for the draft permit and for EPA’s UIC website which contains in-depth information about the Safe Drinking Water Act, the UIC program, and Class II wells. The permit writer’s name, e-mail address, and phone number were also included, and questions were invited. EPA also posted answers to “Frequently Asked Questions” about the draft permit on its website. Finally, EPA held a public information and question-and-answer session prior to the public hearing on May 23, 2012.

Comment 64: The permit application did not list the correct property owners in the ¼-mile area of review; as a result the public notices were sent to another party instead of the owner. This error makes the application and notification process inadequate.

Response 64: We concur that the permit application listed residents of a parcel, but did not list the parcel’s owner, who lives at another address in the vicinity. EPA’s published notices, extended public comment period, and public hearing provided area residents several opportunities for public comment. EPA therefore considers that the information supplied in the application was adequate for EPA to notify the public, gain public comment, and make a decision. This information does not change EPA’s decision and does not require correction to the permit.

Comment 65: The permit application and the administrative record should have been accessible online.

Response 65: UIC regulations do not require that the draft application or administrative record be placed online. Both public notices and materials described in Responses 60 and 63 included information on how to view or obtain copies of materials related to the permit. Therefore, these materials were available to the public throughout the public comment periods.

Comment 66: Are EPA’s statements at the hearing ‘legally binding’?

Response 66: EPA’s remarks at the public hearing are included in the public hearing transcript and are therefore part of the administrative record for the permit decision. Comments made at the information session are for information purposes only, and are not part of the administrative record.

Comment 67: This permit was a “done deal” prior to the public hearing because it had already been approved by EPA and the State.

Response 67: This statement is not accurate. Only a final permit conveys EPA’s final decision on the proposed project. -Following the review of the application and other information, EPA determined that the proposed West Bay #22 injection well met all Federal UIC requirements for geological siting, construction, and operation. We prepared a draft permit for

public review and comment. The public comment period, the public hearing, and considering the comments sent to EPA are part of the process for making a final determination. EPA takes all comments and concerns seriously. This is why EPA held a public meeting and a hearing, and why EPA considers and responds to all comments.

The MDEQ issued its permit for the well prior to EPA's draft permit. The Federal and State permit processes are separate. EPA was not involved with the State permit for this site.

Comment 68: The permit will be modified, transferred to a new owner, changed to a different well class, or receive a new or different waste stream without telling anyone. What is the permit transfer history?

Response 68: In general, wells sometimes do change ownership or undergo other operational changes, but such changes can be made only with EPA knowledge and permission. To make such changes, companies must request EPA to modify an existing permit, or they must apply to EPA for a new permit. For example, permits may be transferred from one owner to another, pursuant to 40 CFR Part 144.38. Many wells in EPA's inventory have been transferred among companies following EPA review and permit modification. Not all permit modifications require EPA to notify the public (see the following comment and response). Changes to the waste stream or a change to a different class of well would require a new permit. Any request for a new permit would undergo a process that includes notifying the public and providing a public comment period on a draft permit decision.

The West Bay #22 well permit application was originated by the West Bay Exploration Company. This well has not yet been drilled and has never been transferred to or from another company.

Comment 69: What is the process for modifying a permit and is there a public notice component to well modifications?

Response 69: In general, companies request modifications via letter to EPA. EPA evaluates the request and determines whether the modification is major or minor. Minor modifications which do not affect geologic siting, construction, or operation do not require a public notice or comment period. Transfer of well ownership is an example of a minor modification. Major modifications that affect geologic siting, construction or operation, such as reworking the well to use a different injection zone or accepting brines from other sources require a public notice and comment period.

Comment 70: The permit could be modified for a higher injection rate.

Response 70: The permit does not limit injection rate. The permit includes a maximum injection pressure, though, and injection pressure acts as a limiting factor. Because the owner/operator cannot inject at a higher pressure, injection is limited to the amount the injection zone can receive at the permitted maximum injection pressure. EPA calculates the injection rate using conservative figures for the physical properties of the injection zone rock and the injected fluid. The owner or operator could request a higher maximum injection pressure. The operator

would have to supply new information about the injection fluid and/or the injection zone formation for EPA to consider a change to injection pressure. Even if injection pressure were modified, it would still be limited to a value less than the fracture pressure of the injection formation.

Comment 71: EPA should require an air analysis and air monitoring at this well site.

Response 71: EPA regulations at 40 C.F.R. Parts 144 and 146 state the requirements and standards that a permit applicant must meet to have a UIC permit application approved. These regulations deal primarily with the geologic siting, well engineering, operating, and monitoring standards for deep injection wells. The UIC regulations do not require air analysis or air monitoring.

Comment 72: There will be odors from oil wells and perhaps the West Bay #22 injection well.

Response 72: EPA regulations at 40 C.F.R. Parts 144 and 146 state the requirements and standards that a permit applicant must meet to have a UIC permit application approved. These regulations deal primarily with the geologic siting, well engineering, operating, and monitoring standards for deep injection wells. EPA does not have regulatory authority for odors or oil and gas production. Concerns about odors or oil and gas production should be directed to MDEQ (see contact information in Response 7).

Comment 73: There are environmental effects of oil well drilling and oil production wells, and the oil production activities do not include public forums, public participation, or oversight.

Response 73: EPA regulations at 40 C.F.R. Parts 144 and 146 state the requirements and standards that a permit applicant must meet to have a UIC permit application approved. These regulations deal primarily with the geologic siting, well engineering, operating, and monitoring standards for deep injection wells. EPA does not have regulatory authority for oil and gas production.

Comment 74: Drilling for gas is damaging aquifers in other States.

Response 74: EPA regulations at 40 C.F.R. Parts 144 and 146 state the requirements and standards that a permit applicant must meet to have a UIC permit application approved. These regulations deal primarily with the geologic siting, well engineering, operating, and monitoring standards for deep injection wells. EPA does not have regulatory authority for oil and gas production.

Comment 75: Oil rigs will obstruct views.

Response 75: EPA regulations at 40 C.F.R. Parts 144 and 146 state the requirements and standards that a permit applicant must meet to have a UIC permit application approved. These regulations deal primarily with the geologic siting, well engineering, operating, and monitoring standards for deep injection wells. The UIC regulations do not address visual obstructions.

Comment 76: There will be an increase in truck transportation because of the oil wells transporting brine. There will be a risk of spills and degradation of county roads. What are the safety risks of transportation, what is the travel distance from the waste source, how many trucks per day deliver or will deliver waste to the injection site, and what is the potential for a truck-related spill? There will also be truck noise.

Response 76: EPA regulations at 40 C.F.R. Parts 144 and 146 state the requirements and standards that a permit applicant must meet to have a UIC permit application approved. These regulations deal primarily with the geologic siting, well engineering, operating, and monitoring standards for deep injection wells. Transportation issues are not addressed by the UIC regulations and are outside the scope of the UIC permit process. Clean up of spills in the course of transportation to the site is addressed under State regulations and is the responsibility of the transporter. Concerns about transportation and noise issues should be directed to MDEQ (see contact information in Response 7).

Comment 77: The company only wants the disposal well to save trucking costs.

Response 77: An EPA permit for an injection well conveys permission to inject waste water based on EPA's finding that the geologic siting, construction, and operation of the well are such that injection will be environmentally safe. According to the regulations, the motives of the company are not something EPA can consider when reviewing a permit application.

Comment 78: EPA cannot guarantee that there won't be a surface spill at the facility, from trucks, or from a pipeline.

Response 78: EPA regulations at 40 C.F.R. Parts 144 and 146 state the requirements and standards that a permit applicant must meet to have a UIC permit application approved. These regulations deal primarily with the geologic siting, well engineering, operating, and monitoring standards for deep injection wells. The UIC program does not regulate the operation of surface facilities. These activities are regulated by the MDEQ. Questions and concerns regarding surface facilities should be directed to MDEQ (see contact information in Response 7).

Comment 79: The well will decrease property values.

Response 79: EPA regulations at 40 C.F.R. Parts 144 and 146 state the requirements and standards that a permit applicant must meet to have a UIC permit application approved. These regulations deal primarily with the geologic siting, well engineering, operating, and monitoring standards for deep injection wells. Real estate values are not addressed by the UIC regulations and so are outside the scope of the UIC permit process.

Comment 80: What are the safeguards against spills at the facility? What are the requirements for surface facilities and pipelines?

Response 80: EPA regulations at 40 C.F.R. Parts 144 and 146 state the requirements and standards that a permit applicant must meet to have a UIC permit application approved. These regulations deal primarily with the geologic siting, well engineering, operating, and monitoring

standards for deep injection wells. Management of surface facilities are not addressed by the UIC regulations and so are outside the scope of the UIC permit process. Concerns about surface facilities should be directed to MDEQ (see contact information in Response 7).

Comment 81: There are concerns about the State's permitting process, its effectiveness, its funding level, and source of funds.

Response 81: The EPA UIC program and permit process is separate from the MDEQ well permit process. EPA regulates injection well geologic siting, construction, and operation. MDEQ has a separate permit program for well location, surface facility requirements, and other activities that are governed by State regulations. EPA has no authority over these State requirements or the State permit process. Concerns about the MDEQ permit, permit process, public input, State funding, and all other matters about the State permit should be directed to MDEQ (see contact information in Response 7).

Comment 82: The same concerns apply to the proposed Haystead #9 brine injection well, another West Bay Exploration Company well application sent to EPA.

Response 82: The application for the proposed Haystead #9 Class II brine injection well is still under review by EPA at this time. Any decisions on the proposed Haystead #9 well will undergo a separate public notice and comment period. EPA cannot consider comments on the proposed Haystead #9 well as a part of the decision-making process for West Bay #22. Comments on another well are outside the scope of this permit action.

Comment 83: How are the public or State regulators notified of ground water contaminated issues related to this well? What is the time frame in which the public must be notified of a contamination event?

Response 83: The UIC regulations deal primarily with the geologic siting, well engineering, operating, and monitoring standards for deep injection wells. The UIC regulations do not require Notification Plans to be filed as part of a permit application for a Class II injection well. The State and/or county health department have jurisdiction for emergency notification regarding drinking water. Concerns about emergency notification should be directed to MDEQ (see contact information in Response 7) or the local health department.

Comment 84: If contamination occurs, who is liable for financial damages, who is responsible for providing an alternative drinking water source, and is there a financial limit to a company's liability for contaminating drinking water?

Response 84: The well owner/operator is responsible for any contamination which occurs on or from the site. Under the SDWA Section 1431, EPA can require operators to clean up any contamination of a USDW due to injection and/or supply alternative water supplies to affected parties. Concerns about liability for surface contamination should be directed to MDEQ (see contact information in Response 7).

Comment 85: The bond amount (\$25,000) is too low to cover clean-up and replacement of drinking water should any contamination occur from the injection well. EPA should require the

company to secure a bond amount large enough to compensate property owners for such events. The bond should address economic impacts to residents and the community.

Response 85: The UIC regulations require the permittee to provide financial assurance for properly plugging the well. There are no provisions under the SDWA which would allow the EPA to require owners/operators to be bonded for other reasons, including the cleanup costs of any potential contamination.

Appeal

In accordance with 40 CFR § 124.19(a), any person who filed comments on the draft permit or participated in the public hearing may petition the Environmental Appeals Board to review any condition of the final permit decision. Such a petition shall include a statement of the reasons supporting review of the decision, including a demonstration that the issue(s) being raised for review were raised during the public comment period (including the public hearing) to the extent required by these regulations. The petition should, when appropriate, show that the permit condition(s) being appealed are based upon either, (1) a finding of fact or conclusion of law which is clearly erroneous, or (2) an exercise of discretion or an important policy consideration which the Environmental Appeals Board should, in its discretion, review.

If you wish to request an administrative review, you must submit such a request by regular mail to the United States Environmental Protection Agency, Clerk of the Board, Environmental Appeals Board (MC 1103B), Ariel Rios Building, 1200 Pennsylvania Avenue, N.W., Washington, D.C. 20460-0001. Requests sent by express mail or hand-delivered must be sent to the United States Environmental Protection Agency, Clerk of the Board, Environmental Appeals Board, Colorado Building, 1341 G Street, NW, Suite 600, Washington, D.C. 20005.

The request must arrive at the Board's office on or before 1/9/2013. The request will be timely if received within this time period. For this request to be valid, it must conform to the requirements of 40 C.F.R. § 124.19. A copy of these requirements is attached (Attachment 2). This request for review must be made prior to seeking judicial review of any permit decision.

Final Permit

The final permit and response to comments is available for viewing at: Jackson District Library, Carnegie Branch, 244 W. Michigan; Monday - Thursday 9 a.m. to 9 p.m., Friday 9 a.m. to 6 p.m., and Saturday 10 a.m. to 5 p.m.